Beaching of oil was also considered initially, through the use of a Monte-Carlo simulation of oil dispersion near a shore. The dispersion of the spill was modeled by considering the spill to be a collection of "packets," each performing a random-walk, with the step size related to the horizontal dispersion coefficient. This technique is frequently used in numerical models of oil spill transport (e.g., Shen and Yapa 1988). A dispersion coefficient of 5 square meters per second was taken from the literature (Shen and Yapa 1988). The spill was assumed to also spread laterally by the physical spreading processes mentioned above. Any packet of oil striking the beach was not transported further. This analysis predicted that approximately 70 percent of a small spill (300 bbl) would beach within 3 days. A smaller percentage of the large spills would beach over this time period (Figure 202-2). Based on this analysis, it was decided that beaching of oil would remove much, but not all of a spill over a 3-day time period.

The method for developing spill envelopes was based on a simple lagrangian analysis of oil spill transport. This method is based on a vector addition to transport forces at work at the site of the spill. These transport mechanisms were applied sequentially depending on the likelihood of being present during the time of spill. For example, mechanical spreading and transport due to tidal currents were applied prior to transport by wind stress because wind stress may be ephemeral whereas spreading and tidal currents are omnipresent.

The tidal currents for San Francisco Bay were based on the published National Oceanic and Atmospheric Administration (NOAA) current charts (DOC 1973). Tidal currents outside the mouth of the Golden Gate were based on commercially available software (Micronautics 1993). Wind speed and direction data for numerous locations within San Francisco Bay, outside the bay, and in Monterey Bay were derived from California Surface Wind Climatology (1992). Estimates of river flow for the San Joaquin and Sacramento Rivers were obtained from U.S.G.S. gauging station data as compiled by the Hydrodata software.

Facility and vessel hazards sites were classified into five zones based on location and transport mechanisms. The zones are listed below:

- Northern San Francisco Bay
- Central San Francisco Bay
- Southern San Francisco Bay
- Outside San Francisco Bay
- Monterey Bay

Tables 202-1 and 202-2 list the facility and vessel navigation hazards for Clean Bay. Individual trajectory analyses are presented in Section 202.4.